# Chapter 10: Traffic Signals

## 10.1 Introduction

Traffic signals are a factor in Work Zone Traffic Control in several ways. Existing traffic signals can be encountered in work zones and often have to be modified to accommodate changing traffic patterns through the life of a project. New traffic signals are often recommended for projects and need to be phased into the project at the appropriate time. Traffic signals are sometimes required for temporary off-site detours and for controlling traffic during one-lane two-way traffic during the staged construction of a bridge. Since traffic signals are recommended by the Regional Traffic Engineer, designed by the Signals and Geometrics Section, and operated by the Highway Divisions, extensive coordination is required to ensure that traffic signals are adequately addressed in the traffic control plans.

## 10.2 Definitions & Abbreviations

**AFAD –** Automated Flagger Assistance Device. A portable, trailer mounted, remotely operated, temporary traffic control device, similar to that of a conventional flagging operation, but involve one trained flagger/operator instead of two.

**Driveway Signal –** A portable, trailer mounted signal for the express purpose of regulating vehicles from driveways that fall within a 1-lane, 2-way traffic pattern.

**Portable Traffic Signal System –** A system of trailer mounted, temporary traffic signals that can be easily transported and reused at different locations.

**RTE –** Regional Traffic Engineer. The member of the Transportation Mobility & Safety Field Operations Section that is responsible for making traffic signal recommendations. Among the recommendations made are where new permanent traffic signals are required and whether temporary signals are necessary on detour routes or temporary haul roads.

**Temporary Signal Design –** A signal plan that accommodates temporary traffic patterns.

**Temporary Traffic Signal –** A traffic signal that is installed for a limited time period then removed when conditions no longer warrant a signal.

**Traffic Signal –** Any power-operated traffic control device that alternately assigns right of way.

## 10.3 Design Criteria

**Temporary Signals on Detour Routes**

- Coordinate with the RTE and Signals and Geometrics if you recognize the need for a Temporary Signal or modifications to an existing signal along the detour.
- Signals and Geometrics will determine stop line locations and locate on the signal plans.
- Phase the signal installation or modification into the Traffic Control plans.
- Use of "Temporary signal" sign. (See Figure 1 below)

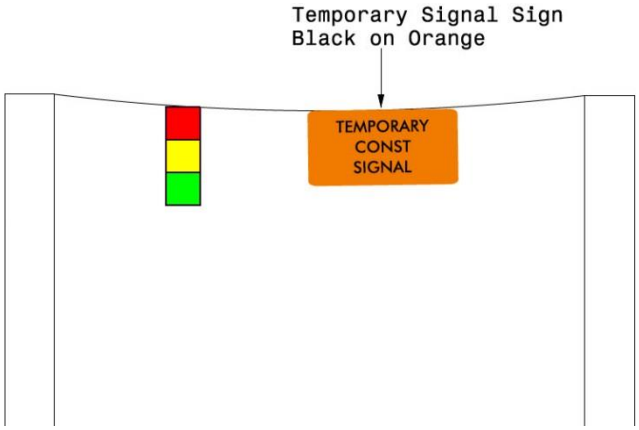



Figure 1 – Temporary Construction Signal

**Temporary Signal Systems for One Lane, Two Way Patterns**

- Portable Signal Systems are temporary traffic signals intended to direct and control traffic through the work zone and serve as a substitute to a conventional flagging operation on one lane, two way patterns. These systems are utilized for construction operations lasting longer than a single work period (Long Durations). Refer to RSD 1101.02 and project special provisions. (See Figure 2)
  - If Portable Signal Systems are utilized, Driveway Signals may be used to regulate driveway traffic located within the one lane operation. All signals within the system described communicate with one another. Refer to project special provisions. (See Figure 3)
- AFADs (Automated Flagger Assistance Device) increase worker safety while maintaining positive temporary traffic control. A trained flagger is still needed to operate the device and should be available to step in as a manual flagger in case of a malfunction. AFADs are typically used for short-term or intermediate-term lane closures. Refer to project special provisions. (See Figure 4)

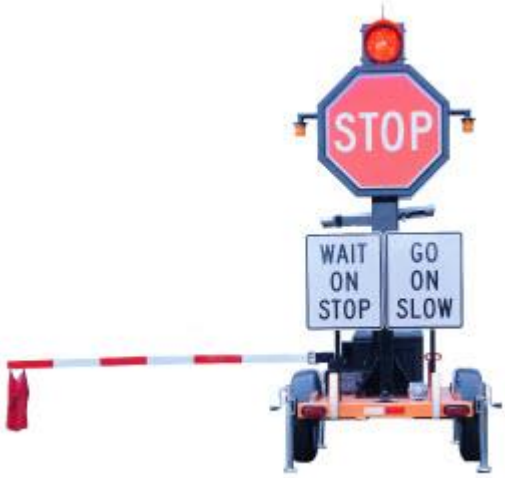
Figure 2 – Portable Traffic Signals


Figure 3 – Driveway Assistance Device

Additional information and or guidance may be obtained within NCDOT RSD 1101.02 and Project Special Provisions - follow links below:

NCDOT-Roadway Standard Drawings (RSD) Division 11
WASP – Project Special Provisions


AFAD - Type I




AFAD - Type II

Figure 4 – Automated Flagger Assistance Devices

Additional information and or guidance may be obtained within the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG) and Project Special Provisions - follow links below:

MUTCG - Chapter 2
WASP – Project Special Provisions

**Other Considerations**

***Early Signal Installations***

- Proposed signals are normally installed during the final phases of construction. Occasionally, the RTE will recommend that the proposed signal be installed at the start of construction. If this is the case, early installation needs to be phased into the Traffic Control plans. Signals and Geometrics should notify Traffic Control of early signal installations.

***Left Turn Lanes***

- When a temporary traffic shift impacts a signalized intersection with existing left turn lanes, every effort should be made to allow for left turn lanes during the traffic shift.